Lauterbach & Amen, LLP
668 N. River Road
Naperville, IL 60563

Actuarial Valuation as of January 1, 2018

JOLIET POLICE PENSION FUND

Utilizing Data as of December 31, 2017
For the Contribution Year January 1, 2018 to December 31, 2018

LAUTERBACH & AMEN, LLP

Actuarial Valuation – Funding Recommendation

Lauterbach & Amen, LLP

CERTIFIED PUBLIC ACCOUNTANTS

JOLIET POLICE PENSION FUND

Contribution Year Ending: December 31, 2018
Actuarial Valuation Date: January 1, 2018
Utilizing Data as of December 31, 2017

Submitted by:

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Todd A. Schroeder
January 7, 2019

LAUTERBACH & AMEN, LLP

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ACTUARIAL CERTIFICATION

This report documents the results of the actuarial valuation of the Joliet Police Pension Fund. The purpose is to report the actuarial contribution requirement for the contribution year January 1, 2018 to December 31, 2018. Determinations for purposes other than meeting the employer's actuarial contribution requirements may be significantly different from the results herein.

The results in this report are based on information and data submitted by the City of Joliet, Illinois including studies performed by prior actuaries. We did not prepare the actuarial valuations for the years prior to January 1, 2018. Those valuations were prepared by other actuaries whose reports have been furnished to us, and our disclosures are based upon those reports. An audit of the information was not performed, but high-level reviews were performed for general reasonableness, as appropriate, based on the purpose of the valuation. The accuracy of the results is dependent upon the accuracy and completeness of the underlying information. The results of the actuarial valuation and these supplemental disclosures rely on the information provided.

The valuation results summarized in this report involve actuarial calculations that require assumptions about future events. The City of Joliet, Illinois selected certain assumptions, while others were the result of guidance and/or judgment. We believe that the assumptions used in this valuation are reasonable and appropriate for the purposes for which they have been used.

To the best of our knowledge, all calculations are in accordance with the applicable funding requirements, and the procedures followed and presentation of results conform to generally accepted actuarial principles and practices. The undersigned of Lauterbach & Amen, LLP, with actuarial credentials, meets the Qualification Standards of the American Academy of Actuaries to render this Actuarial Opinion. There is no relationship between the City of Joliet, Illinois and Lauterbach & Amen, LLP that impairs our objectivity.

The information contained in this report was prepared for the use of the Joliet Police Pension Fund and the City of Joliet, Illinois in connection with our actuarial valuation. It is not intended or necessarily suitable for other purposes. It is intended to be used in its entirety to avoid misrepresentations.

Respectfully Submitted,

LAUTERBACH & AMEN, LLP

Todd A. Schroeder

Todd A. Schroeder, EA

MANAGEMENT SUMMARY

Contribution Recommendation
Funded Status
Management Summary

CONTRIBUTION RECOMMENDATION

	Prior Valuation*	Current Valuation
Contribution Requirement	$17,624,586	$17,792,021
Expected Payroll	$27,660,834	$28,570,973
Contribution Requirement as a Percent of Expected Payroll	63.72%	62.27%

Recommended Contribution has Increased $167,435 from Prior Year.

^ The City and Board agreed to a 3-year transition plan for the January 1, 2017 actuarial valuation. As a result, the current year contribution requirement reflecting the transition plan is $16,883,093. See the Actuarial Funding Policies section of this report for further details.

FUNDED STATUS

	Prior Valuation*	Current Valuation
Normal Cost	$9,944,802	$8,714,710
Market Value of Assets	$191,982,345	$222,700,217
Actuarial Value of Assets	$213,348,423	$228,758,905
Actuarial Accrued Liability	$386,616,392	$421,564,252
Unfunded Actuarial Accrued Liability	$173,267,969	$192,805,347
Percent Funded		
Actuarial Value of Assets	55.18%	54.26%
Market Value of Assets	49.66%	52.83%

Funded Percentage has Decreased by 0.92% on an Actuarial Value of Assets Basis.

*Prior Valuation Completed by Gabriel, Roeder, Smith & Company.

MANAGEMENT SUMMARY – COMMENTS AND ANALYSIS

Contribution Results

The contribution recommendation is based on the funding policies and procedures that are outlined in the "Actuarial Funding Policies" section of this report.

The State of Illinois statutes for pension funds contain parameters that should be used to determine the minimum amount of contribution to a public pension fund. Those parameters and the resulting minimum contribution can be found in the "Illinois Statutory Minimum Contribution" section of this report.

Defined Benefit Plan Risks

Asset Growth

Pension funding involves preparing plan assets to pay benefits for the members when they retire. During their working careers, assets need to build with contributions and investment earnings, and then the pension fund distributes assets during retirement. Based on the fund's current mix of employees and funded status, the fund should be experiencing positive asset growth on average if requested contributions are made and expected investment earnings come in. In the current year, the fund asset growth was positive by approximately $30.7 million.

Asset growth is important long-term. Long-term cash flow out of the pension fund is primarily benefit payments. Expenses make up a smaller portion. The fund should monitor the impact of expected benefit payments and the impact on asset growth in the future. In the next 5 years, benefits payments are anticipated to increase 45-50%, or approximately $7.4 million. In the next 10 years, the expected increase in benefit payments is 105-108%, or approximately $15.6 million.

Unfunded Liability:

Unfunded liability represents dollars we expect to be in the pension fund already for the fund members based on funding policy. To the extent dollars are not in the pension fund the fund is losing investment returns on those dollars going forward. Payments to unfunded liability pay for the lost investment earnings, as well as the outstanding unfunded amount. If payment is not made, the unfunded liability will grow.

In the early 1990s, many pension funds in Illinois adopted an increasing payment to handle unfunded liability due to a change in legislation. The initial payments decreased, and payments were anticipated to increase annually after that. In many situations, payments early on may be less than the interest on unfunded liability, which means unfunded liability is expected to *increase* even if contributions are at the recommended level.

The current contribution recommendation includes a payment to unfunded liability that is approximately $1.2 million less than interest on the unfunded liability. All else being equal and contributions being made, unfunded liability would still be expected to increase. The employer and the fund should anticipate currently that improvement in the funded percent will be mitigated in the short-term. The employer and the fund should understand this impact as we progress forward to manage expectations.

Actuarial Value of Assets:
The pension fund smooths asset returns that vary from expectations over a four-year period. The intention over time is that asset returns for purposes of funding recommendations are a combination of several years. The impact is intended to smooth out the volatility of contribution recommendations over time, but not necessarily increase or decrease the level of contributions over the long-term.

When asset returns are smoothed, there are always gains or losses on the Market Value of Assets that are going to be deferred for current funding purposes, and recognized in future years. Currently, the pension fund is deferring approximately $8.9 million in gains on the Market Value of Assets. These are asset gains that will be recognized in upcoming periods, independent of the future performance of the Market Value of Assets.

Plan Assets
The results in this report are based on the assets held in the pension fund. Assets consist of funds held for investment and for benefit payments as of the valuation date. In addition, assets may be adjusted for other events representing dollars that are reasonably expected to be paid out from the pension fund or deposited into the pension fund after the actuarial valuation date as well.

The current fund assets are audited.

The Plan Assets Used in this Report are Audited.

The actuarial value of assets under the funding policy is equal to the fair market value of assets, with unexpected gains and losses smoothed over 4 years. In addition, an employer contribution receivable, equal to the amount of the most recent tax levy, is accounted for in each year's actuarial value of assets. More detail on the Actuarial Value of Assets can be found in the funding policy section of the report.

Demographic Data

Demographic factors can change from year to year within a pension fund. Changes in this category include hiring new employees, employees retiring or becoming disabled, retirees passing away, and other changes. Demographic changes can cause an actuarial gain (contribution that is less than expected compared to the prior year) or an actuarial loss (contribution that is greater than expected compared to the prior year).

Demographic gains and losses occur when the assumptions over the one-year period for employee changes do not meet our long-term expectation. For example, if no employees become disabled during the year, we would expect a liability gain. If more employees become disabled than anticipated last year, we would expect a liability loss. Generally, we expect short-term fluctuations in demographic experience to create 1%-3% gains or losses in any given year, but to balance out in the long-term.

In the current report, the key demographic changes were as follows:

New hires: The fund added 9 new active members in the current year through hiring, 2 of whom terminated employment in the current year. When a new member is admitted to the pension fund, the employer contribution will increase to reflect the new member. The increase in the recommended contribution in the current year for new fund members is approximately $64,000.

Retirement: There were 2 members of the fund who retired during the year. When a fund member retires, the normal cost will decrease. Any change in the actuarial liability will be considered when determining the amount to pay towards unfunded liability each year. The decrease in the recommended contribution in the current year due to the retirement experience is approximately $60,000.

Termination: There were 4 non-vested members of the fund who terminated employment during the year, 2 of whom were hired in the current year. One of the members took a refund. The fund is no longer obligated to pay a benefit to the members in the future. The decrease in the recommended contribution in the current year due to the termination experience is approximately $22,000.

Mortality: There were 5 retirees who passed away during the year, 3 of whom had eligible surviving spouses. In addition, there was 1 surviving spouse who passed away during the year. When a beneficiary passes away, the fund liability will decrease as the pension fund no longer will make future payments to the beneficiary. If there is an eligible surviving spouse, the fund liability will increase to represent the value of the expected payments that will be made to the spouse. In the current year, there were also 170 beneficiaries who maintained benefit collection status throughout the year. As the beneficiary population ages and continues to collect benefits, the fund liability will increase. The net decrease in the recommended contribution in the current year due to the mortality experience is approximately $75,000.

Salary Increases: Salary increases were less than anticipated in the current year. Most active members received no salary increase as outlined in the current collective bargaining agreement. This caused a decrease in the recommended contribution in the current year of approximately $880,000.

Assumption Changes

In the current valuation, the demographic assumptions were changed to the tables shown in the Actuarial Assumptions section of this report. The changes were made based on a study of Police Officers and Police Pension Funds in Illinois. The assumptions impacted include:

- Mortality Rates
- Mortality Improvement Rates
- Retirement Rates
- Disability Rates
- Termination Rates

We have also updated the mortality assumption to include mortality improvements as stated in the most recently released MP-2016 table. In addition, the rates are being applied on a fully-generational basis. See page 29 for more details on the specific mortality updates made.

In the current valuation, certain economic assumptions were changed to the rates shown in the Actuarial Assumptions section of this report. The individual pay increase assumption has been updated based on review of the settled bargaining agreement between the City of Joliet and the Illinois Fraternal Order of Police Labor Council, for the period January 1, 2016 through December 31, 2019. We have also updated the total payroll increase assumption, and the assumed consumer price index and inflation rates.

The above stated assumption changes were made to better reflect the future anticipated experience of the Fund. See the table on the following page for the impact of these changes on the current valuation.

Funding Policy Changes

The funding policy was not changed from the prior year.

ACTUARIAL CONTRIBUTION RECOMMENDATION - RECONCILIATION

Actuarial liability is expected to increase each year for both interest for the year and as active employees earn additional service years towards retirement. Similarly, actuarial liability is expected to decrease when the fund pays benefits to inactive employees.

Contributions are expected to increase as expected pay increases under the funding policy for the Fund.

Other increases or decreases in actuarial liability (key changes noted below) will increase or decrease the amount of unfunded liability in the plan. To the extent unfunded liability increases or decreases unexpectedly, the contribution towards unfunded liability will also change unexpectedly.

	Actuarial Liability	Contribution Recommendation
Salary Increase Less than Expected	$ (8,768,517)	$ (775,953)
Demographic Changes	(1,305,468)	(188,079)
Assumption Changes	(4,182,976)	(461,878)
Asset Return Less than Expected *	-	169,246
Contributions Less than Expected	-	194,848
Total Actuarial Experience	$ (14,256,961)	$ (1,061,816)

*The impact on contribution due to asset performance is based on the Actuarial Value of Assets.

Key demographic changes were discussed in the prior section.

VALUATION OF FUND ASSETS

Market Value of Assets
Actuarial Value of Assets

MARKET VALUE OF ASSETS

Statement of Assets

	Prior Valuation	Current Valuation
Cash and Cash Equivalents	$ 5,236,799	$ 9,949,577
Certificates of Deposits	1,375,733	1,839,605
State and Local Obligations	27,966,105	37,994,074
US Government and Agency Obligation	33,148,562	25,584,051
Insurance Contracts	9,683,265	10,451,593
Mutual Funds	114,217,901	136,509,408
Receivables (Net of Payables)	353,980	371,909
Net Assets Available for Pensions	$ 191,982,345	$ 222,700,217

The Total Value of Assets has Increased Approximately $30,720,000 from Prior Valuation.

Statement of Changes in Assets

Total Market Value - Prior Valuation	$ 191,982,345
Plus - Employer Contributions	14,779,880
Plus - Employee Contributions	2,868,088
Plus - Return on Investments	26,522,445
Less - Benefit and Related Payments	(13,363,228)
Less - Other Expenses	(89,313)
Total Market Value - Current Valuation	$ 222,700,217

The Return on Investment on the Market Value of Assets for the Fund was Approximately 13.6% Net of Administrative Expenses.

The return on investments shown has been determined as the Return on Assets from the statement of changes in assets, as a percent of the average of the beginning and ending Market Value of Assets. Return on Investment is net of the Other Expenses as shown. The Return on Investments has been excluded from the Total Market Value of Assets at the end of the year for this calculation.

MARKET VALUE OF ASSETS (GAIN)/LOSS

Current Year (Gain)/Loss on Market Value of Assets

Total Market Value - Prior Valuation	$ 191,982,345
Contributions	17,647,968
Benefit Payments	(13,363,228)
Expected Return on Investments	10,475,736
Expected Total Market Value - Current Valuation	206,742,821
Actual Total Market Value - Current Valuation	222,700,217
Current Market Value (Gain)/Loss	$ (15,957,396)

Expected Return on Investments	$ 10,475,736
Actual Return on Investments (Net of Expenses)	26,433,132
Current Market Value (Gain)/Loss	$ (15,957,396)

The Return on the Market Value of Assets was Higher than Expected Over the Most Recent Year.

The (Gain)/Loss on the Market Value of Assets has been determined based on expected returns at the actuarial rate.

DEVELOPMENT OF THE ACTUARIAL VALUE OF ASSETS

Total Market Value - Current Valuation		$ 222,700,217
Adjustment for Prior (Gains)/Losses		
	Full Amount	
First Preceding Year	$ (15,957,396)	(11,968,047)
Second Preceding Year	(452,117)	(226,059)
Third Preceding Year	13,053,324	3,263,331
Fourth Preceding Year	3,738,584	-
Total Deferred (Gain)/Loss		(8,930,775)
Initial Actuarial Value of Assets - Current Valuation		$ 213,769,442
Plus Employer Contribution Receivable		14,989,463
Less Adjustment for the Corridor		-
Actuarial Value of Assets - Current Valuation		$ 228,758,905

The Actuarial Value of Assets is Equal to the Fair Market Value of Assets with Unanticipated Gains/Losses Recognized over 4 Years. The Actuarial Value of Assets is Currently 103% of the Market Value.

(GAIN)/LOSS ON THE ACTUARIAL VALUE OF ASSETS

Total Actuarial Value - Prior Valuation	$ 213,348,423
Plus - Employer Contributions	14,779,880
Plus - Employee Contributions	2,868,088
Plus - Return on Investments	11,215,055
Less - Benefit and Related Payments	(13,363,228)
Less - Other Expenses	(89,313)
Total Actuarial Value - Current Valuation	$ 228,758,905

The Return on Investment on the Actuarial Value of Assets for the Fund was Approximately 5.2% Net of Administrative Expenses.

The Actuarial Value of Assets incorporates portions of gains and losses over multiple years.

HISTORICAL ASSET PERFORMANCE

The chart below shows the historical rates of return on plan assets for both Market Value of Assets and Actuarial Value of Assets.

	Market Value	Actuarial Value
First Preceding Year	13.6%	5.2%

The returns on assets shown above were calculated based on the annual return on investment for the year, as a percentage of the average value of the assets for the year.

For purposes of determining the average value of assets during the year, the ending market value of assets has been adjusted to net out to the portion related to the investment returns themselves. All other cash flows are included.

For purposes of determining the annual return on investment we have adjusted the figures shown on the preceding pages. The figures shown on the preceding pages are net of investment expenses. We have made an additional adjustment to net out administrative expenses. Netting out administrative expenses allows us to capture returns for the year that can be used to make benefit payments as part of the ongoing actuarial process.

The adjustment we make is for actuarial reporting purposes only. By netting out administrative expenses and capturing return dollars that are available to pay benefits, it provides us a comparison to the estimated rate of return on assets, but does not provide a figure that would be consistent with the return rates that are determined by other parties. Therefore, this calculated rate of return should not be used to analyze investment performance of the Fund or the performance of the investment professionals.

RECOMMENDED CONTRIBUTION DETAIL

ACTUARIAL ACCRUED LIABILITY

	Current Valuation
Active Employees	$ 212,587,801
Inactive Employees	
Terminated Employees - Vested	459,434
Retired Employees	184,124,022
Disabled Employees	10,069,430
Other Beneficiaries	14,323,565
Total Inactive Employees	208,976,451
Total Actuarial Accrued Liability	$ 421,564,252

The Total Actuarial Liability has Increased from Prior Valuation (See Management Summary).

FUNDED STATUS

	Current Valuation
Total Actuarial Accrued Liability	$ 421,564,252
Total Actuarial Value of Assets	228,758,905
Unfunded Actuarial Accrued Liability	$ 192,805,347
Total Market Value of Assets	$ 222,700,217
Percent Funded	
Actuarial Value of Assets	54.26%
Market Value of Assets	52.83%

Funded Percentage as of the Valuation Date is Subject to Volatility on Assets and Liability in the Short-Term.

RECOMMENDED CONTRIBUTION DETAIL

DEVELOPMENT OF THE EMPLOYER NORMAL COST

	Current Valuation
Total Normal Cost	$ 8,714,710
Estimated Employee Contributions	(2,831,383)
Employer Normal Cost	$ 5,883,327

At a 100% Funding Level, the Normal Cost Contribution is Still Required.

NORMAL COST AS A PERCENTAGE OF EXPECTED PAYROLL

	Current Valuation
Expected Payroll	$ 28,570,973
Employee Normal Cost Rate	9.910%
Employer Normal Cost Rate	20.59%
Total Normal Cost Rate	30.50%

Ideally, the Employer Normal Cost Rate will Remain Stable.

CONTRIBUTION RECOMMENDATION

	Current Valuation
Employer Normal Cost*	$ 6,466,174
Amortization of Unfunded Accrued Liability/(Surplus)	11,325,847
Funding Requirement	$ 17,792,021

The Recommended Contribution has Increased from Prior Valuation (See Management Summary).

*Employer Normal Cost Contribution includes interest through the end of the year.

ACTUARIAL METHODS – RECOMMENDED CONTRIBUTION

Actuarial Valuation Date	January 1, 2018
Data Collection Date	December 31, 2017
Actuarial Cost Method	Entry Age Normal (Level % Pay)
Amortization Method	Level % Pay (Closed)
Amortization Target	100% Funded over 26 years
Asset Valuation Method	4-Year Smoothed Market Value

The contribution and benefit values of the Pension Fund are calculated by applying actuarial assumptions to the benefit provisions and census information furnished, using the actuarial cost methods described. The actuarial cost and amortization method allocates the projected obligations of the plan over the working lifetimes of the plan participants.

The recommended contribution amount shown in this report is based on the methods summarized above. The Actuarial Funding Policies section of the report will include a more detailed description of the funding methods being used.

The Actuarial Funding Methods are meant to provide a systematic process for determining contributions on an annual basis. The methods do not impact the expectation of future benefit payments. The methods only impact the way dollars are contributed towards future benefit payments.

Different Actuarial Funding Methods may achieve funding goals with differing levels of success. Certain methods are more efficient and more stable on an annual basis.

ILLINOIS STATUTORY MINIMUM CONTRIBUTION

Minimum Contribution
Methods and Assumptions

STATUTORY MINIMUM CONTRIBUTION

	Minimum Contribution
Contribution Requirement	$17,469,584
Expected Payroll	$28,570,973
Contribution Requirement as a Percent of Expected Payroll	61.14%

^ The City and Board agreed to a 3-year transition plan for the January 1, 2017 actuarial valuation. As a result, the current year contribution requirement reflecting the transition plan is $16,561,401. See the Actuarial Funding Policies section of this report for further details.

FUNDED STATUS – STATUTORY MINIMUM

	Minimum Contribution
Normal Cost	$10,469,012
Market Value of Assets	$222,700,217
Actuarial Value of Assets	$215,632,076
Actuarial Accrued Liability	$402,279,764
Unfunded Actuarial Accrued Liability	$186,647,688
Percent Funded	
Actuarial Value of Assets	53.60%
Market Value of Assets	55.36%

ILLINOIS STATUTORY MINIMUM CONTRIBUTION

The Statutory Minimum Contribution is based on funding methods and funding parameters in the Illinois statutes for pension funding. The resulting contribution is lower than the recommended contribution for the current plan year. The lower contribution amount is not recommended because it represents only a deferral of contributions when compared to the recommended contribution method.

Actuarial Funding methods for pensions are best applied to provide a balance between the long-term goals of a variety of stakeholders:

1. Beneficiaries – the fund participants are interested in benefit security and having the dollars there to pay benefits when retired

2. Employers – cost control and cost stability over the long-term

3. Taxpayers – paying for the services they are receiving from active employees

The Statutory Minimum Contribution methods are not intended to provide a better system in any of the above categories long-term. The parameters are not recommended for a long-term funding strategy.

The Statutory Minimum methods put into place in 2011 were intended to provide short-term budget relief for Employer contributions. An employer using the Statutory Minimum parameters for current funding should view the contributions as short-term relief. Our recommendation in this situation is for a pension fund and an employer to work towards a long-term funding strategy that better achieves the long-term funding goals, over a period that does not exceed 3-5 years.

The Securities and Exchange Commission in 2013 used the phrase "Statutory Underfunding" to describe situations where contributions appear to be more manageable in the short-term, but set up future contribution requirements that are less likely to be manageable.

ACTUARIAL METHODS – ILLINOIS STATUTORY MINIMUM CONTRIBUTION

Actuarial Valuation Date	January 1, 2018
Data Collection Date	December 31, 2017
Actuarial Cost Method	Projected Unit Credit (Level % of Pay)
Amortization Method	Level % Pay (Closed)
Remaining Amortization Period	90% Funded over 23 years
Asset Valuation Method	5-Year Smoothed Market Value

The contribution and benefit values of the Pension Fund are calculated by applying actuarial assumptions to the benefit provisions and census information furnished, using the actuarial cost methods described. The actuarial cost and amortization method allocates the projected obligations of the plan over the working lifetimes of the plan participants.

The Actuarial Funding Methods are meant to provide a systematic process for determining contributions on an annual basis. The methods do not impact the expectation of future benefit payments. The methods only impact the way dollars are contributed towards future benefit payments.

Different Actuarial Funding Methods may achieve funding goals with differing levels of success. Certain methods are more efficient and more stable on an annual basis.

ACTUARIAL VALUATION DATA

Active Employees
Retirees and Beneficiaries

ACTUARIAL VALUATION DATA

ACTIVE EMPLOYEES

	Current Valuation
Vested	228
Nonvested	38
Total Active Employees	266
Total Payroll	$ 28,114,119

INACTIVE EMPLOYEES

	Current Valuation
Terminated Employees - Vested	2
Retired Employees	133
Disabled Employees	14
Other Beneficiaries	28
Total Inactive Employees	177

SUMMARY OF BENEFIT PAYMENTS

	Current Valuation
Terminated Employees - Vested	$ 4,728
Retired Employees	938,486
Disabled Employees	50,077
Other Beneficiaries	113,973
Total Inactive Employees	$ 1,107,264

Benefits shown for terminated employees under deferred retirement are not currently in pay status.

ACTUARIAL FUNDING POLICIES

Actuarial Cost Method
Financing Unfunded Accrued Liability
Actuarial Value of Assets

ACTUARIAL FUNDING POLICIES

ACTUARIAL COST METHOD

The actuarial cost method allocates the projected obligations of the plan over the working lifetimes of the plan participants.

In accordance with the Pension Fund's Funding Policy the actuarial cost method for the recommended contribution basis is Entry Age Normal (Level Percent of Pay). The Entry Age Normal Cost Method is a method under which the actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit age. The portion of this actuarial present value allocated to a valuation year is called normal cost. The portion of the actuarial present value not provided at a valuation date by the actuarial present value of future normal costs is called the actuarial liability.

FINANCING UNFUNDED ACTUARIAL ACCRUED LIABILITY

The Unfunded Actuarial Accrued Liability may be amortized over a period either in level dollar amounts or as a level percentage of projected payroll.

In accordance with the Pension Fund's Funding Policy for the recommended contribution, the unfunded actuarial accrued liabilities are amortized by level percent of payroll contributions to a 100% funding target over the remaining 26 future years.

Effective January 1, 2017, the City contribution will be phased-in over a three-year period. Under the three-year smoothing period, the increase in the City's contribution will be phased in according to the following schedule:

Plan Year	Portion Recognized	Portion to Subtract	Amount to Subtract from City Contribution
2017	33%	67%	$1,946,914
2018	67%	33%	$958,928
2019	100%	0%	$0

ACTUARIAL VALUE OF ASSETS

The pension fund is an ongoing plan. The employer wishes to smooth the effect of volatility in the market value of assets on the annual contribution. The Actuarial Value of Assets is equal to the Market Value of Assets with unanticipated gains/losses recognized over four years. In addition, an employer contribution receivable, equal to the amount of the most recent tax levy, is accounted for in each year's actuarial value of assets.

ACTUARIAL FUNDING POLICIES

The asset valuation method is intended to create an Actuarial Value of Assets that remains reasonable in relation to the Market Value of Assets over time. The method produces results that can fall above and below the Market Value of Assets. The period of recognition is short.

It is intended that the period of recognition is short enough to keep the Actuarial Value of Assets within a decent range of the Market Value. The employer has not placed a specific corridor around the Market Value of Assets.

ACTUARIAL ASSUMPTIONS

ACTUARIAL ASSUMPTIONS

NATURE OF ACTUARIAL CALCULATIONS

The results documented in this report are estimates based on data that may be imperfect and on assumptions about future events. Certain plan provisions may be approximated or deemed immaterial, and, therefore, are not valued. Assumptions may be made about participant data or other factors. Reasonable efforts were made in this valuation to ensure that significant items in the context of the actuarial liabilities or costs are treated appropriately, and not excluded or included inappropriately.

Actual future experience will differ from the assumptions used in the calculations. As these differences arise, the expense for accounting purposes will be adjusted in future valuations to reflect such actual experience.

A range of results different from those presented in this report could be considered reasonable. The numbers are not rounded, but this is for convenience only and should not imply precision which is not inherent in actuarial calculations.

ACTUARIAL ASSUMPTIONS IN THE VALUATION PROCESS

The contribution and benefit values of the Pension Fund are calculated by applying actuarial assumptions to the benefit provisions and census information furnished, using the actuarial cost methods described in the previous section.

The principal areas of financial risk which require assumptions about future experience are:

- Long-term Rates of Investment Return
- Patterns of Pay Increases for Members
- Rates of Mortality Among Members and Beneficiaries
- Rates of Withdrawal of Active Members
- Rates of Disability Among Members
- Age Patterns of Actual Retirement

Actual experience of the Pension Fund will not coincide exactly with assumed experience. Each valuation provides a complete recalculation of assumed future experience and takes into account all past differences between assumed and actual experience. The result is a continual series of adjustments to the computed contribution requirement.

From time to time it becomes appropriate to modify one or more of the assumptions, to reflect experience trends (but not random year-to-year fluctuations).

Details behind the selection of the actuarial assumptions can be found in the assumption document provided to the client. The client has reviewed and approved the assumptions as a reasonable expectation of the future anticipated experience under the plan.

ACTUARIAL ASSUMPTIONS UTILIZED

Expected Return on Investments 6.50% net of administrative expenses.

CPI-U 2.75%

Total Payroll Increases 3.25%

Individual Pay Increases 4.25% - 36.18%

Individual salary increases include a long-term average increase for inflation, average annual increases for promotions, and any additional increases for a step program. Sample Rates as Follows:

Service	Rate	Service	Rate
0	36.18%	8	7.50%
1	24.60%	9	4.25%
2	7.58%	10	4.25%
3	4.25%	15	4.25%
4	4.25%	20	4.25%
5	7.50%	25	4.25%
6	4.25%	30	4.25%
7	4.25%	35	4.25%

Retirement Rates Joliet Retirement Rates Cap Age 58 for Police 2016. Sample Rates as Follows:

Age	Rate	Age	Rate
50	0.250	55	0.250
51	0.150	56	0.100
52	0.150	57	0.100
53	0.150	58	1.000
54	0.150		

Withdrawal Rates

100% of the L&A Assumption Study for Police 2016. Sample Rates as Follows:

Age	Rate	Age	Rate
25	0.041	40	0.027
30	0.039	45	0.014
35	0.036	50	0.003

Disability Rates

100% of the L&A Assumption Study for Police 2016. Sample Rates as Follows:

Age	Rate	Age	Rate
25	0.0005	40	0.0028
30	0.0010	45	0.0043
35	0.0018	50	0.0064

Mortality Rates

Active Mortality follows the Sex Distinct Raw Rates as Developed in the RP-2014 Study, with Blue Collar Adjustment. These Rates are Improved Generationally using MP-2016 Improvement Rates.

Retiree Mortality follows the L&A Assumption Study for Police 2016. These Rates are Experience Weighted with the Raw Rates as Developed in the RP-2014 Study, with Blue Collar Adjustment and Improved Generationally using MP-2016 Improvement Rates.

Disabled Mortality follows the Sex Distinct Raw Rates as Developed in the RP-2014 Study for Disabled Participants, with Blue Collar Adjustment. These Rates are Improved Generationally using MP-2016 Improvement Rates.

Spouse Mortality follows the Sex Distinct Raw Rates as Developed in the RP-2014 Study. These Rates are Improved Generationally using MP-2016 Improvement Rates.

Married Participants

80% of Active Participants are Assumed to be Married. Female Spouses are Assumed to be 4 Years Younger than Male Spouses.

SUMMARY OF PRINCIPAL PLAN PROVISIONS

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ESTABLISHMENT OF THE FUND

The Police Pension Fund is established and administered as prescribed by "Article 3. Police Pension Fund – Municipalities 500,000 and Under" of the Illinois Pension Code.

ADMINISTRATION

The Police Pension Fund is administered by a Board of Trustees located in each municipality maintaining a pension fund for its police officers. Its duties are to control and manage the pension fund, to hear and determine applications for pensions, to authorize payment of pensions, to establish rules, to pay expenses, to invest funds, and to keep records.

EMPLOYEE CONTRIBUTIONS

Employees contribute 9.910% of salary.

NORMAL RETIREMENT PENSION BENEFIT

<u>Hired Prior to January 1, 2011</u>

Eligibility: Age 50 with at least 20 years of creditable service and no longer a police officer.

Benefit: 50% of final salary is payable commencing at retirement for 20 years of service. An additional 2.5% of final salary is added for each additional year of service in excess of 20 years of service (not to exceed 75% of final salary). "Final salary" is the salary attached to rank held on the last day of services or for 1 year prior to the last day, whichever is greater.

Annual Increase in Benefit: An officer will receive an initial increase of 1/12 of 3% for each month that has elapsed since retirement. The initial increase date will be the later of the first day of the month following the attainment of age 55, or the first anniversary of the date of retirement. Subsequent increases of 3% of the current pension amount (including prior increases) will be provided in each January thereafter.

NORMAL RETIREMENT PENSION BENEFIT - CONTINUED

Hired on or After January 1, 2011

Eligibility: Age 55 with at least 10 years of creditable service and no longer a police officer.

Benefit: 2.5% of final average salary for each year of service is payable at retirement (not to exceed 75% of final average salary). "Final average salary" is determined by dividing the highest total salary over 96 consecutive months of service in the last 120 months of service by the total number of months of service in the period. Annual salary for this purpose will not exceed $106,800, indexed by the lesser of 3% or ½ of the CPI-U for the 12 months ending with the September preceding each November 1. The salary cap will not decrease.

Annual Increase in Benefit: The initial increase date will be the January 1st following the later of the attainment of age 60, or the first anniversary of the date of retirement. Subsequent increases will occur on each subsequent January 1st. The first increase and subsequent increases will be the lesser of 3% of the original benefit or ½ of the CPI-U for the 12 months ending with the September preceding each November 1, applied to the original benefit.

EARLY RETIREMENT PENSION BENEFIT

Hired Prior to January 1, 2011

None

Hired on or After January 1, 2011

Eligibility: Age 50 with at least 10 years of creditable service and no longer a police officer.

Benefit: The normal retirement pension benefit reduced by ½ of 1% for each month that the police officer's age is under age 55.

Annual Increase in Benefit: The initial increase date will be the January 1st following the later of the attainment of age 60, or the first anniversary of the date of retirement. Subsequent increases will occur on each subsequent January 1st. The first increase and subsequent increases will be the lesser of 3% of the original benefit or ½ of the CPI-U for the 12 months ending with the September preceding each November 1, applied to the original benefit.

PENSION TO SURVIVORS

Hired Prior to January 1, 2011

Death - Line of Duty

Surviving spouse is entitled to 100% of the salary attached to the rank of the police officer on the last day of service, payable immediately.

Death - Non-Duty

Current Pensioners (Including Disabled Pensioners): Surviving spouse to receive continuation of the pension.

Active Employee with 20+ Years of Service: Surviving spouse is entitled to the full pension earned by the police officer at the time of death.

Active Employee with 10-20 Years of service: Surviving spouse is entitled to 50% of the salary attached to the rank of the police officer on the last day of service, payable immediately

Annual Increase in Benefit: None.

Hired on or After January 1, 2011

Death - Line of Duty

Surviving spouse is entitled to 100% of the salary attached to the rank of the police officer on the last day of service, payable immediately.

Death - Non-Duty

Current Pensioners (Including Disabled Pensioners), Active Employee with 20+ Years of Service, and Active Employee with 10-20 Years of service: Surviving spouse to receive 66 ⅔% of the police officer's earned pension at the date of death.

Annual Increase in Benefit: The initial increase date will be the January 1st after the attainment of age 60 by the recipient of the survivor's pension. Subsequent increases will occur on each subsequent January 1st. The first increase and subsequent increases will be the lesser of 3% of the original benefit or ½ of the CPI-U for the 12 months ending with the September preceding each November 1, applied to the original survivor's benefit amount.

TERMINATION BENEFIT

Hired Prior to January 1, 2011

Eligibility: At least 8 years but less than 20 years of creditable service.

Benefit: 2.5% of final salary for each year of service is payable beginning at age 60. "Final salary" is based on the greater of salary during the last year of service prior to termination of employment or the pay rate for the police officer at termination of employment.

Annual Increase in Benefit: An officer will receive an initial increase of 3% on the first anniversary of the date of start of payments. Subsequent increases of 3% of the current pension amount will be provided in each January thereafter.

Hired on or After January 1, 2011

Eligibility: At least 10 years but less than 20 years of creditable service.

Benefit: 2.5% of final salary for each year of service is payable beginning at age 60. "Final salary" is based on the greater of salary during the last year of service prior to termination of employment or the pay rate for the police officer at termination of employment. Annual salary for this purpose will not exceed $106,800, indexed by the lesser of 3% or ½ of the CPI-U for the 12 months ending with the September preceding each November 1. The salary cap will not decrease.

Annual Increase in Benefit: The initial increase date will be the January 1st following the first payment. Subsequent increases will occur on each subsequent January 1st. The first increase and subsequent increases will be the lesser of 3% of the original benefit or ½ of the CPI-U for the 12 mos. ending with the September preceding each November 1, applied to the original benefit amount.

DISABILITY BENEFIT

Hired Prior to January 1, 2011

Eligibility: Disability (duty or non-duty).

Benefit: A police officer who becomes disabled on duty is entitled to receive a pension equal to the greater of 65% of final salary or the pension they would have been entitled to upon retirement at the time of disability. For a non-duty disability, the police officer is entitled to 50% of final salary. “Final salary” is based on the pay rate for the police officer on the last day of service.

Annual Increase in Benefit: The initial increase date will be the January 1st following the attainment of age 60. Subsequent increases will occur on each subsequent January 1st. The first increase is 3% of the original benefit for each full year that has passed since the pension began. Subsequent increases will be the 3% of the original pension benefit amount.

Hired on or after January 1, 2011

Eligibility: Disability (duty or non-duty).

Benefit: A police officer who becomes disabled on duty is entitled to receive a pension equal to the greater of 65% of final salary or the pension they would have been entitled to upon retirement at the time of disability. For a non-duty disability, the police officer is entitled to 50% of final salary. “Final salary” is based on the pay rate for the police officer on the last day of service.

Annual Increase in Benefit: The initial increase date will be the January 1st following the attainment of age 60. Subsequent increases will occur on each subsequent January 1st. The first increase and subsequent increases will be the lesser of 3% of the original benefit or ½ of the CPI-U for the 12 months ending with the September preceding each November 1, applied to the original benefit amount.

GLOSSARY OF TERMS

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Actuarial Accrued Liability –The actuarial present value of future benefits based on employees' service rendered to the measurement date using the selected actuarial cost method. It is that portion of the Actuarial Present Value of plan benefits and expenses allocated to prior years of employment. It is not provided for by future Normal Costs.

Actuarial Cost Method – The method used to allocate the projected obligations of the plan over the working lifetimes of the plan participants.

Actuarial Value of Assets – The value of the assets used in the determination of the Unfunded Actuarial Accrued Liability. The Actuarial Value of Assets is related to Market Value of Assets, with adjustments made to spread unanticipated gains and losses for a given year over a period of several years. Actuarial Value of Assets is generally equally likely to fall above or below the Market Value of Assets, and generally does not experience as much volatility over time as the Market Value of Assets.

Asset Valuation Method **–** A valuation method designed to smooth random fluctuations in asset values. The objective underlying the use of an asset valuation method is to provide for the long-term stability of employer contributions.

Funding Policy – A set of procedures for a Pension Fund that outlines the "best practices" for funding the pension benefits based on the goals of the plan sponsor. A Funding Policy discusses items such as assumptions, Actuarial Cost Method, assets, and other parameters that will best help the sponsor meet their goal of working in the best interest of the plan participant.

Market Value of Assets – The value of the cash, bonds, securities and other assets held in the pension trust as of the measurement date.

Normal Cost –The present value of future benefits earned by employees during the current fiscal year. It is that portion of the Actuarial Present Value of benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method.

Unfunded Actuarial Accrued Liability **–** The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The Unfunded Actuarial Accrued Liability is amortized over a period either in level dollar amounts or as a level percentage of projected payroll.

PROJECTIONS

City of Joliet Police Pension Fund
Actuarial Valuation Projection Results Based on P.A. 96-1495 as of January 1, 2018 (Based on Projected Unit Credit Cost Method)
($ in Thousands)

Jan. 1	Actuarial Accrued Liability	Market Value of Assets	Actuarial Value of Assets	Unfunded Liability	Actuarial Value Funded Ratio	Payroll	Employer Normal Cost	Statutory Minimum Contribution	Statutory Contribution % of Projected Pay	Employee Contributions	Benefit Payments
2018	$402,280	$222,700	$215,632	$186,648	53.6%	$28,571	$8,134	$16,561	58.0%	$2,831	$13,363
2019	425,308	242,046	234,901	190,407	55.2%	29,500	8,476	18,199	61.7%	2,923	14,247
2020	449,122	263,250	256,777	192,345	57.2%	30,458	8,798	18,814	61.8%	3,018	15,345
2021	473,646	285,310	282,118	191,528	59.6%	31,448	9,096	19,238	61.2%	3,117	16,547
2022	498,712	307,901	307,901	190,812	61.7%	32,470	9,367	19,660	60.5%	3,218	17,932
2023	524,343	331,073	331,073	193,270	63.1%	33,526	9,608	20,313	60.6%	3,322	19,304
2024	550,414	354,968	354,968	195,446	64.5%	34,615	9,815	20,957	60.5%	3,430	20,803
2025	576,907	379,614	379,614	197,294	65.8%	35,740	9,985	21,591	60.4%	3,542	22,316
2026	603,682	404,918	404,918	198,764	67.1%	36,902	10,117	22,215	60.2%	3,657	23,958
2027	630,659	430,860	430,860	199,799	68.3%	38,101	10,208	22,832	59.9%	3,776	25,658
2028	657,953	457,618	457,618	200,335	69.6%	39,339	10,255	23,441	59.6%	3,899	27,221
2029	685,284	484,980	484,980	200,304	70.8%	40,618	10,257	24,047	59.2%	4,025	29,036
2030	712,785	513,160	513,160	199,625	72.0%	41,938	10,212	24,652	58.8%	4,156	30,684
2031	740,471	542,263	542,263	198,208	73.2%	43,301	10,120	25,262	58.3%	4,291	32,286
2032	768,066	572,114	572,114	195,952	74.5%	44,708	9,978	25,887	57.9%	4,431	34,123
2033	795,734	602,995	602,995	192,739	75.8%	46,161	9,788	26,537	57.5%	4,575	35,755
2034	823,379	634,947	634,947	188,433	77.1%	47,661	9,549	27,230	57.1%	4,723	37,441
2035	851,075	668,203	668,203	182,871	78.5%	49,210	9,262	27,987	56.9%	4,877	39,012
2036	878,932	703,070	703,070	175,862	80.0%	50,810	8,927	28,843	56.8%	5,035	40,438
2037	906,877	739,713	739,713	167,164	81.6%	52,461	8,546	29,863	56.9%	5,199	41,906
2038	934,960	778,500	778,500	156,460	83.3%	54,166	8,119	31,167	57.5%	5,368	43,293
2039	963,423	820,131	820,131	143,292	85.1%	55,926	7,650	33,038	59.1%	5,542	44,418
2040	992,048	865,155	865,155	126,894	87.2%	57,744	7,139	36,628	63.4%	5,722	45,744
2041	1,021,124	919,012	919,012	102,112	90.0%	59,621	6,591	6,591	11.1%	5,908	46,770
2042	1,051,478	946,330	946,330	105,148	90.0%	61,558	6,934	6,934	11.3%	6,100	47,894
2043	1,083,426	975,084	975,084	108,343	90.0%	63,559	7,293	7,293	11.5%	6,299	48,813
2044	1,117,207	1,005,486	1,005,486	111,721	90.0%	65,625	7,670	7,670	11.7%	6,503	49,626
2045	1,152,906	1,037,615	1,037,615	115,291	90.0%	67,757	8,066	8,066	11.9%	6,715	50,495
2046	1,190,756	1,071,681	1,071,681	119,076	90.0%	69,960	8,480	8,480	12.1%	6,933	51,285
2047	1,230,977	1,107,879	1,107,879	123,098	90.0%	72,233	8,914	8,914	12.3%	7,158	52,026
2048	1,273,760	1,146,384	1,146,384	127,376	90.0%	74,581	9,369	9,369	12.6%	7,391	52,756
2049	1,319,226	1,187,303	1,187,303	131,923	90.0%	77,005	9,846	9,846	12.8%	7,631	53,562
2050	1,367,513	1,230,761	1,230,761	136,751	90.0%	79,507	10,346	10,346	13.0%	7,879	54,431

City of Joliet Police Pension Fund
Actuarial Valuation Projection Results Based on 26 Years Closed Amortization as of January 1, 2018 (Based on Entry Age Normal Cost Method)
($ in Thousands)

Jan. 1	Actuarial Accrued Liability	Market Value of Assets	Actuarial Value of Assets	Unfunded Liability	Actuarial Value Funded Ratio	Payroll	Employer Normal Cost	Recommended Contribution	City Contribution % of Projected Pay	Employee Contributions	Benefit Payments
2018	$421,564	$222,700	$228,759	$192,805	54.3%	$28,571	$6,466	$16,833	58.9%	$2,831	$13,363
2019	443,811	242,269	250,472	193,339	56.4%	29,500	6,648	18,301	62.0%	2,923	14,247
2020	466,623	263,540	277,267	189,356	59.4%	30,458	6,804	18,533	60.8%	3,018	15,345
2021	489,908	285,286	303,226	186,682	61.9%	31,448	6,935	18,837	59.9%	3,117	16,547
2022	513,482	307,421	325,655	187,826	63.4%	32,470	7,036	19,385	59.7%	3,218	17,932
2023	537,350	330,233	348,997	188,353	64.9%	33,526	7,106	19,902	59.4%	3,322	19,304
2024	561,373	353,605	372,870	188,503	66.4%	34,615	7,143	20,404	58.9%	3,430	20,803
2025	585,518	377,551	397,303	188,215	67.9%	35,740	7,146	20,891	58.5%	3,542	22,316
2026	609,628	401,962	422,185	187,443	69.3%	36,902	7,113	21,361	57.9%	3,657	23,958
2027	633,609	426,795	447,473	186,135	70.6%	38,101	7,044	21,815	57.3%	3,776	25,658
2028	657,562	452,207	473,325	184,237	72.0%	39,339	6,937	22,252	56.6%	3,899	27,221
2029	681,192	477,963	499,504	181,688	73.3%	40,618	6,792	22,674	55.8%	4,025	29,036
2030	704,619	504,247	526,196	178,423	74.7%	41,938	6,609	23,082	55.0%	4,156	30,684
2031	727,843	531,129	553,473	174,370	76.0%	43,301	6,388	23,477	54.2%	4,291	32,286
2032	750,579	558,399	581,125	169,454	77.4%	44,708	6,129	23,861	53.4%	4,431	34,123
2033	772,975	586,288	609,386	163,589	78.8%	46,161	5,833	24,238	52.5%	4,575	35,755
2034	794,922	614,776	638,238	156,684	80.3%	47,661	5,502	24,610	51.6%	4,723	37,441
2035	816,482	644,021	667,844	148,638	81.8%	49,210	5,135	24,982	50.8%	4,877	39,012
2036	837,752	674,227	698,410	139,342	83.4%	50,810	4,735	25,358	49.9%	5,035	40,438
2037	858,645	705,425	729,972	128,673	85.0%	52,461	4,304	25,747	49.1%	5,199	41,906
2038	879,198	737,778	762,701	116,496	86.7%	54,166	3,843	26,155	48.3%	5,368	43,293
2039	899,636	771,658	796,977	102,659	88.6%	55,926	3,354	26,596	47.6%	5,542	44,418
2040	919,727	806,995	832,741	86,987	90.5%	57,744	2,839	27,087	46.9%	5,722	45,744
2041	939,742	844,250	870,471	69,272	92.6%	59,621	2,302	27,659	46.4%	5,908	46,770
2042	960,175	883,533	910,308	49,868	94.8%	61,558	2,377	29,343	47.7%	6,100	47,894
2043	981,274	926,306	954,710	26,564	97.3%	63,559	2,454	30,744	48.4%	6,299	48,813
2044	1,003,199	973,438	1,003,199	0	100.0%	65,625	2,534	2,534	3.9%	6,503	49,626
2045	1,025,957	1,023,504	1,025,957	0	100.0%	67,757	2,616	2,616	3.9%	6,715	50,495
2046	1,049,693	1,047,160	1,049,693	0	100.0%	69,960	2,701	2,701	3.9%	6,933	51,285
2047	1,074,532	1,071,918	1,074,532	0	100.0%	72,233	2,789	2,789	3.9%	7,158	52,026
2048	1,100,568	1,097,868	1,100,568	0	100.0%	74,581	2,879	2,879	3.9%	7,391	52,756
2049	1,127,811	1,125,023	1,127,811	0	100.0%	77,005	2,973	2,973	3.9%	7,631	53,562
2050	1,156,284	1,153,406	1,156,284	0	100.0%	79,507	3,070	3,070	3.9%	7,879	54,431